

CLAIMS

1. In combination:

a) a first bobbin case assembly comprising:

i) a first wall structure mountable operably upon a support and defining a first receptacle within which a first supply of a first thread is stored;

ii) a first tensioning element having a circumference defined by a first surface,

the first thread projecting from the first receptacle and wrapped at least partially around the circumference of the first tensioning element so that a first frictional force of a first magnitude resisting drawing of the first thread from the first receptacle is generated between the first surface and the first thread so that a first draw tension is required to be applied to the first thread to draw the first thread from the first receptacle within the first bobbin assembly operably mounted on the support; and

b) a second bobbin case assembly comprising:

18 i) a second wall structure operably mountable operably upon a
support and defining a second receptacle within which a second
supply of a second thread is stored; and

20 ii) a second tensioning element having a circumference defined
by a second surface,

22 the second thread projecting from the second receptacle and
wrapped at least partially around the circumference of the second
24 tensioning element so that a second frictional force resisting drawing
of the second thread from the second receptacle is generated
26 between the second surface and the second thread so that a second
draw tension is required to be applied to the second thread to draw
28 the second thread from the second receptacle with the second
bobbin case assembly operably mounted on a support,

30 wherein the magnitudes of the first and second frictional forces are
different,

32 whereby the first and second bobbin case assemblies can be selectively
operably mounted upon a support to select one of the first and second draw
34 tensions.

2. The combination according to claim 1 further comprising a support
2 upon which the first and second bobbin case assemblies can be selectively
operably mounted.

3. The combination according to claim 2 further comprising a thread
2 drawing mechanism that is part of a thread stitching system, the thread drawing
mechanism engagable a) with the first thread with the first bobbin case assembly
4 operably mounted on the support and b) with the second thread with the second
bobbin case assembly operably mounted on the support to draw the first and
6 second threads from the first and second receptacle as the thread stitching system
is operated.

4. The combination according to claim 3 wherein there is a first
2 coefficient of friction between the first thread and the first surface and a second
coefficient of friction between the second thread and the second surface and the
4 first coefficient of friction is different than the second coefficient of friction.

5. The combination according to claim 4 wherein the first and second
2 surfaces have different characteristics that account for the difference in the first
and second coefficients of friction.

6. The combination according to claim 1 wherein the first and second
2 surfaces have different areas that are contacted respectively by the first and
second threads and that account for the difference in the magnitudes of the first
4 and second frictional forces.

7. The combination according to claim 5 wherein the first and second
2 surfaces have different frictional characteristics that account for the difference in
the first and second coefficients of friction.

8. The combination according to claim 7 wherein the first and second
2 surfaces have different compositions that account for the difference in the first and
second coefficients of friction.

9. The combination according to claim 7 wherein the first and second
2 surfaces have different textures that account for the difference in the first and
second coefficients of friction.

10. The combination according to claim 4 wherein the first and second threads have different characteristics that account for the difference in the first and second coefficients of friction.

11. The combination according to claim 1 wherein the first wall structure bounds the first receptacle, the first bobbin case assembly comprises a first bobbin in the first receptacle around which the first supply of thread is wrapped, and the first bobbin is supported for rotation around a first axis relative to the first wall structure as the first thread is drawn out of the first receptacle.

12. The combination according to claim 11 wherein the first wall structure comprises a first peripheral wall extending around the first axis and having a first opening through which the first thread projects to engage the first tensioning element.

13. The combination according to claim 12 wherein the first tensioning element is cantilevered from the first peripheral wall.

14. In combination:

a) a bobbin case assembly comprising:

a wall structure mountable operably upon a support and defining a
4 receptacle within which a supply of thread is stored;

b) a first tensioning element having a circumference defined by a first
6 surface; and

c) a second tensioning element having a circumference defined by a
8 second surface,

the first and second tensioning elements interchangeably mountable in an
10 operative position on the wall structure,

wherein with the first tensioning element mounted in an operative position
12 on the wall structure, the thread from the supply can be directed against the first
surface so that a first frictional force of a first magnitude resisting drawing of the
14 thread from the receptacle is generated between the first surface and the thread
so that a first draw tension is required to be applied to draw the thread from the
16 receptacle,

wherein with the second tensioning element mounted in an operative
18 position on the wall structure, the thread from the supply can be directed against
the second surface so that a second frictional force of a second magnitude
20 resisting drawing of the thread from the receptacle is generated between the
second surface and the thread so that a second draw tension is required to be
22 applied to draw the thread from the receptacle,

wherein the first and second magnitudes are different,

24 whereby the first and second tensioning elements can be selectively
mounted in an operative position on the wall structure to select one of the first and
26 second draw tensions.

15. The combination according to claim 14 further comprising a support
2 to which the wall structure is operably mounted and a thread drawing mechanism
that is part of a thread stitching system, the thread drawing mechanism engagable
4 with the thread to draw the thread from the receptacle as the thread stitching
system is operated.

16. The combination according to claim 14 wherein there is a first
2 coefficient of friction between the thread and the first surface and a second
coefficient of friction between the thread and the second surface and the first
4 coefficient of friction is different than the second coefficient of friction.

17. The combination according to claim 16 wherein the first and second
2 surfaces have different characteristics that account for the difference in the first
and second coefficients of friction.

18. The combination according to claim 17 wherein the first and second
2 surfaces have different areas that are contacted respectively by the first and
second threads that account for the difference in the magnitudes of the first and
4 second frictional forces.

19. The combination according to claim 17 wherein the first and second
2 surfaces have different frictional characteristics that account for the difference in
the first and second coefficients of friction.

20. The combination according to claim 19 wherein the first and second
2 surfaces have different compositions that account for the difference in the first and
second coefficients of friction.

21. The combination according to claim 19 wherein the first and second
2 surfaces have different textures that account for the difference in the first and
second coefficients of friction.

22. A method of selecting draw tension for thread that is engaged by a
2 thread drawing mechanism in a stitching system and drawn from a supply of

thread in a bobbin case assembly that is operably mounted on a support, the
4 method comprising the steps of:

providing a first bobbin case assembly configuration that causes a first
6 predetermined thread draw tension to result with the first bobbin case assembly
configuration operably mounted on the support attributable at least in part to a first
8 frictional resistance force generated between thread on the first bobbin case
assembly and a first circumferential surface on a first tensioning element on the
10 first bobbin case assembly configuration;

providing a second bobbin case assembly configuration that causes a
12 second predetermined draw tension, different than the first predetermined draw
tension, to result with the second bobbin case assembly configuration operably
14 mounted on the support attributable at least in part to a second frictional
resistance force generated between thread on the second bobbin case assembly
16 and a second circumferential surface on a second tensioning element on the
second bobbin case assembly configuration being different than the first frictional
18 resistance force; and

selectively operably mounting one of the first and second bobbin case
20 assembly configurations on the support based on a thread draw tension that is
desired.

23. The method of selecting draw tension for thread according to claim
2 22 wherein the steps of providing first and second bobbin case assembly
configurations comprises using threads having at least one of a) a different
4 composition, b) a different structure, and c) a different size on the first and second
bobbin case assembly configurations to cause the first and second frictional
6 resistance forces to be different.

24. The method of selecting draw tension for thread according to claim
2 22 wherein the steps of providing first and second bobbin case assembly
configurations comprises providing the first surface with a first frictional
4 characteristic that is different than a second frictional characteristic of the second
surface to cause the first and second frictional resistance forces to be different
6 with the first and second bobbin case assembly configurations used in conjunction
with the same thread.

25. The method of selecting draw tension for thread according to claim
2 24 wherein the steps of providing the first surface with a first frictional
characteristic and the second surface with a second frictional characteristic
4 comprise providing the first and second surfaces with a different area that is
engaged by thread on the first and second bobbin case assembly configurations.

26. The method of selecting draw tension for thread according to claim
2 25 wherein the steps of providing the first surface with a first frictional
characteristic and the second surface with a second frictional characteristic
4 comprise providing different compositions for the first and second surfaces.

27. The method of selecting draw tension for thread according to claim
2 25 wherein the steps of providing the first surface with a first frictional
characteristic and the second surface with a second frictional characteristic
4 comprise providing different textures for the first and second surfaces.

28. The method of selecting draw tension for thread according to claim
2 22 wherein the steps of providing first and second bobbin case assembly
configurations comprise providing completed fully operable, separate, first and
4 second bobbin case assembly configurations that can be interchangeably operably
mounted on the support.

29. The method of selecting draw tension for thread according to claim
2 22 wherein the step of providing the second bobbin case assembly configuration
comprises reconfiguring the first bobbin case assembly configuration.